

# GE Makes Durathon Industrial Battery to Meet Growing Energy Needs

A new long-life battery built to aid utility companies in meeting the growing energy demands created by electric vehicles and the integration of solar and wind power on the national power grid was developed with the help of high-energy X-rays.

Scientists with General Electric Energy Storage Technologies, a unit of GE Transportation, developed new battery chemistry by using X-rays to understand the mechanism by which sodium batteries discharge and store energy. The knowledge they gained helped them improve battery capacity, power and safety. At the same time, the new battery design has the potential to lower overall power costs by eliminating the need for expensive installation of a controlled environment to keep the battery function at peak performance.

The APS's high-energy X-rays provided penetration power combined with a small focusing area to see into battery cells and map chemical distributions and reactions.

This new battery, called Durathon, supports a broad range of utility-oriented applications, such as: transmission and distribution upgrade deferral, time shifting, congestion relief, peak shaving, load following and reserve capacity. Additionally, it will support utility transition, renewable power generation telecom power support, uninterruptable power supply and industrial transportation.

## Impact

According to GE, because of its proprietary chemistry, the Durathon battery has the ability to last up to two decades while providing optimal charge and discharge times, even in extreme temperature environments. The 550-volt batteries are half the size of conventional lead acid batteries but last 10 times longer.

The Durathon battery's advanced design and science generated more than 30 patents.

GE built a new plant to produce Durathon batteries in Schenectady, N.Y., and at full capacity is expected to employ 450 workers. GE researchers will continue to work on enhancements to the battery chemistry which related systems technology.

GE is making a \$150 million investment to build upon the Durathon battery technology through the development of new materials, new manufacturing technologies and intelligent controls. The company plans to expand the battery use into next-generation energy-efficient buses, locomotives and mining vehicles.



## Partners

Research was done by GE scientists using the APS.

## Funding

The U.S. Department of Energy's Office of Basic Energy Science funds the APS. GE paid for use of the APS X-ray beamline.

## More Info

Video: <http://geenergystorage.com>

## Timeline

The Durathon battery is based on sodium metal halide chemistry, which was originally pioneered by Beta R&D in the 1980s. GE bought the company in 2007 and refined the technology, in part, through work at the APS. Production of Durathon batteries began in September 2011, and the plant officially opened in July 2012. GE announced in October 2012 that the Durathon batteries had completed qualifying tests to earn NEBS Level 3 certification.



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